

CLAIMS

What is claimed is:

1. An integrated circuit comprising:

5 a substrate including active circuitry;
an interconnect overlying the substrate;

a conductive grid, the conductive grid including a plurality of
conductive lines located in a first interconnect layer of the
interconnect, each of the plurality of conductive lines extending
10 across at least a majority of the integrated circuit in the first
interconnect layer parallel to a first direction, each of the
plurality of conductive lines are electrically coupled to each
other;

wherein the conductive grid comprises:

15 a first conductive line of the plurality of conductive lines having
a first width;

a second conductive line of the plurality of conductive lines
having a second width, the second conductive line is
spaced from the first conductive line in a second direction
20 from the first conductive line, the second direction being
perpendicular to the first direction, the second width
being less than the first width;

a third conductive line of the plurality of conductive lines
having a third width, the third conductive line is spaced
25 from the second conductive line in the second direction
from the second conductive line, the third width being
greater than the second width, the second conductive line
between the first and second conductive lines;

a fourth conductive line of the plurality of conductive lines having a fourth width, the fourth conductive line is spaced from the third conductive line in the second direction from the third conductive line, the fourth width being less than the third width, the third conductive line between the second and fourth conductive lines;

a fifth conductive line of the plurality of conductive lines having a fifth width, the fifth conductive line is spaced from the fourth conductive line in the second direction from the fourth conductive line, the fifth width being greater than the fourth width, the fourth conductive line between the third and fifth conductive lines.

2. The integrated circuit of claim 1 wherein the first width, the third width, and the fifth width are the same width.

3. The integrated circuit of claim 1 wherein the second width and the fourth width are the same width.

4. The integrated circuit of claim 1 wherein:
the first width, the third width, and the fifth width are the same width;
the second width and the fourth width are the same width.

5. The integrated circuit of claim 1 wherein:
a sixth conductive line of the plurality of conductive lines having a sixth width, the sixth conductive line is spaced from the fifth conductive line in the second direction from the fifth conductive line, the sixth width being less than the fifth width, the fifth conductive line between the fourth and sixth conductive lines;

a seventh conductive line of the plurality of conductive lines having a seventh width, the seventh conductive line is spaced from the sixth conductive line in the second direction from the sixth conductive line, the seventh width being greater than the sixth width, the sixth conductive line between the fifth and seventh conductive lines.

6. The integrated circuit of claim 5 wherein:

the first width, the third width, the fifth width, and seventh are the same width;

the second width, the fourth width, and sixth width are the same width.

7. The integrated circuit of claim 1 wherein:

a sixth conductive line of the plurality of conductive lines having a sixth width, the sixth conductive line is located between the first conductive line and the second conductive line, the sixth width being less than the first width and greater than the second width;

a seventh conductive line of the plurality of conductive lines having a seventh width, the seventh conductive line is located between the second conductive line and the third conductive line, the seventh width being greater than the second width and less than the third width;

an eighth conductive line of the plurality of conductive lines having an eighth width, the eighth conductive line is located between the third conductive line and the fourth conductive line, the eighth width being less than the third width and greater than the fourth width;

a ninth conductive line of the plurality of conductive lines having a ninth width, the ninth conductive line is located between the fourth conductive line and the fifth conductive line, the ninth width being greater than the fourth width and less than the fifth width.

8. The integrated circuit of claim 7 wherein:

a tenth conductive line of the plurality of conductive lines having a tenth width, the tenth conductive line is located between the sixth conductive line and the second conductive line, the tenth width being less than the sixth width and greater than the second width;

an eleventh conductive line of the plurality of conductive lines having an eleventh width, the eleventh conductive line is located between the second conductive line and the seventh conductive line, the eleventh width being greater than the second width and less than the seventh width;

a twelfth conductive line of the plurality of conductive lines having an twelfth width, the twelfth conductive line is located between the eighth conductive line and the fourth conductive line, the twelfth width being less than the eighth width and greater than the fourth width;

a thirteenth conductive line of the plurality of conductive lines having a thirteenth width, the thirteenth conductive line is located between the fourth conductive line and the ninth conductive line, the thirteenth width being greater than the fourth width and less than the ninth width.

9. The integrated circuit of claim 8 wherein the tenth width, the eleventh width, the twelfth width, and the thirteenth width are the same width.

10. The integrated circuit of claim 8 wherein:

a fourteenth conductive line of the plurality of conductive lines having

5 a fourteenth width, the fourteenth conductive line is located between the tenth conductive line and the second conductive line, the fourteenth width being less than the tenth width and greater than the second width;

an fifteenth conductive line of the plurality of conductive lines having

10 an fifteenth width, the fifteenth conductive line is located between the second conductive line and the eleventh conductive line, the fifteenth width being greater than the second width and less than the eleventh width;

a sixteenth conductive line of the plurality of conductive lines having

15 an sixteenth width, the sixteenth conductive line is located between the twelfth conductive line and the fourth conductive line, the sixteenth width being less than the twelfth width and greater than the fourth width;

a seventeenth conductive line of the plurality of conductive lines

20 having a seventeenth width, the seventeenth conductive line is located between the fourth conductive line and the thirteenth conductive line, the seventeenth width being greater than the fourth width and less than the thirteenth width.

11. The integrated circuit of claim 7 wherein the sixth width, the seventh width, the eighth width, and the ninth width are the same width.

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12. The integrate circuit of claim 1 wherein:

the conductive grid includes a second plurality of conductive lines

located in a second interconnect layer of the interconnect, each

of the second plurality of conductive lines running across at

5 least a majority of the integrated circuit in the second

interconnect layer parallel to the second direction, each of the

second plurality of conductive lines are electrically coupled to

each other and to each of the plurality of conductive lines;

a sixth conductive line of the second plurality of conductive lines has a

10 sixth width;

a seventh conductive line of the plurality of conductive lines having a

seventh width, the seventh conductive line is spaced from the

sixth conductive line in a first direction from the sixth

conductive line, the seventh width being less than the sixth

15 width;

an eighth conductive line of the plurality of conductive lines having an

eighth width, the eighth conductive line is spaced from the

seventh conductive line in the first direction from the seventh

conductive line, the eighth width being greater than the seventh

20 width, the eighth line between the seventh and fifth conductive

lines, the seventh conductive line between the eighth and sixth

conductive lines;

a ninth conductive line of the plurality of conductive lines having a

ninth width, the ninth conductive line is spaced from the eighth

25 conductive line in the first direction from the eighth conductive

line, the ninth width being less than the eighth width, the eighth

conductive line between the ninth and seventh lines;

a tenth conductive line of the plurality of conductive lines having a tenth width, the tenth conductive line is spaced from the ninth conductive line in the first direction from the ninth conductive line, the tenth width being greater than the ninth width, wherein the ninth conductive line is between the eighth and the tenth conductive lines.

13. The integrated circuit of claim 12 wherein:
the sixth width, the eighth width, and the tenth width are the same width;

10 the seventh width and the ninth width are the same width.

14. The integrated circuit of claim 12 wherein:
the first interconnect layer is above the second interconnect layer;
a via is located at each location wherein a conductive line of the plurality crosses over a conductive line of the second plurality with a top part of the via in electrical contact with the conductive line of the plurality and the bottom part of the via in electrical contact with the conductive line of the second plurality.

15. The integrated circuit of claim 1 further comprising:
20 a plurality of conductive terminals overlying the interconnect, the plurality of conductive terminal being positioned at a first pitch in the second direction, wherein a distance between a center of the first conductive line and a center of the third conductive line is equal to the first pitch, wherein a distance between a center of the third conductive line and a fifth conductive line is equal to
25 the first pitch.

16. The integrated circuit of claim 1 wherein a center of each conductive line of the plurality is located at a first distance from a center of an immediately adjacent conductive line of the plurality.
17. The integrated circuit of claim 1 further comprising:
5 a first signal line including at least a portion located between the first conductive line and the second conductive line in the interconnect layer.
18. The integrated circuit of claim 1 wherein each of the plurality of
10 integrated circuit in the first interconnect layer parallel to the first direction.
19. The integrated circuit of claim 1 wherein each of the conductive lines of the plurality have a uniform width along at least a substantial majority of the integrated circuit.
20. The integrated circuit of claim 1 wherein the conductive grid is biased
15 to provide a non ground voltage.
21. The integrated circuit of claim 1 wherein the conductive grid is biased to provide a ground voltage.
22. The integrated circuit of claim 1 further comprising:
20 a second conductive grid, the second conductive grid including a second plurality of conductive lines located in the first interconnect layer of the interconnect, each of the second plurality of conductive lines extending across at least a majority of the integrated circuit in the first interconnect layer parallel to

a first direction, each of the second plurality of conductive lines are electrically coupled to each other;

wherein:

5 a sixth conductive line of the second plurality of conductive lines has a sixth width, the sixth conductive line is located between the first conductive line and the second conductive line;

10 a seventh conductive line of the plurality of conductive lines having a seventh width, the seventh conductive line is located between the second conductive line and the third conductive line, the seventh width being less than the sixth width;

15 an eighth conductive line of the plurality of conductive lines having an eighth width, the eighth conductive line is located between the third conductive line and the fourth conductive line, the eighth width being greater than the seventh width;

20 a ninth conductive line of the plurality of conductive lines having a ninth width, the ninth conductive line is located between the fourth conductive line and the fifth conductive line, the ninth width being less than the eighth width;

25 a tenth conductive line of the plurality of conductive lines having a tenth width, the tenth conductive line is located adjacent to the fifth conductive line in the second direction from the fifth conductive line, the tenth width being greater than the ninth width;

wherein the first conductive grid is bias to provide a first voltage and the second conductive grid is biased to provide a second voltage different from the first voltage.

23. An integrated circuit comprising:

5 a substrate including active circuitry;

an interconnect overlying the substrate;

a conductive grid, the conductive grid including a plurality of

conductive lines located in a first interconnect layer of the interconnect, each of the plurality of conductive lines extending across at least a substantial majority of the integrated circuit in the first interconnect layer parallel to a first direction, each of the plurality of conductive lines are electrically coupled to each other, each of the electrically conductive lines have a uniform width;

15 wherein the plurality of conductive lines includes a first group with each conductive line of the first group having a first width;

wherein the plurality of conductive lines includes a second group with each conductive line of the second group having a second width, the first width is greater than the second width;

20 wherein each conductive line of the second plurality is located between two lines of the first plurality;

wherein the plurality of conductive lines includes a third group with each conductive line of the third group having a third width;

wherein the third width is less than the first width and greater than the second width,

25 wherein each line of the second group is located between two lines of the third group with no lines of the first group located there between.

24. The integrated circuit of claim 23 wherein:

the plurality of conductive lines includes a fourth group with each

conductive line of the fourth group having a fourth width,

the fourth width is less than the third width and greater than the

5 second width,

each line of the second group is located between two lines of the

fourth group with no lines of the first group located there

between.

25. The integrated circuit of claim 24 wherein each line of the second

10 group is located between two lines of the fourth group with no lines of the

first group or the third group located there between.

26. The integrated circuit of claim 24 wherein:

the plurality of conductive lines includes a fifth group with each

conductive line of the fifth group having a fifth width;

15 the fifth width is less than the fourth width and greater than the second

width;

each line of the second group is located between two lines of the fifth

group with no lines of the first group located there between.

27. The integrated circuit of claim 26 each line of the second group is

20 located between two lines of the fifth group with no lines of the first group,

the third group or the fourth group located there between.

28. The integrated circuit of claim 26 wherein:

the conductive grid includes a second plurality of conductive lines
located in a second interconnect layer of the interconnect, each
of the plurality of conductive lines extending across at least a
5 substantial majority of the integrated circuit in a second
interconnect layer parallel to a second direction, the second
direction is perpendicular to the first direction, each of the
second plurality of conductive lines are electrically coupled to
each other and to each of the plurality of conductive lines, each
10 of the second plurality of conductive lines have a uniform
width;

the second plurality of conductive lines includes a fourth group with
each conductive line of the fourth group having a fourth width;

the second plurality of conductive lines includes a fifth group with
15 each conductive line of the fifth group having a fifth width, the
fourth width is greater than the fifth width;

each conductive line of the fifth plurality is located between two lines
of the fourth plurality.

29. An integrated circuit comprising:

20 a substrate including active circuitry;

an interconnect overlying the substrate;

a conductive grid, the conductive grid including a plurality of
conductive lines located in a first interconnect layer of the
interconnect, each of the plurality of conductive lines extending
25 across at least a majority of the integrated circuit in the first
interconnect layer parallel to a first direction, each of the
plurality of conductive lines are electrically coupled to each
other;

wherein:

a first conductive line of the plurality of conductive lines has a first width;

5 a second conductive line of the plurality of conductive lines having a second width, the second conductive line is spaced from the first conductive line in a second direction from the first conductive line, the second direction being perpendicular to the first direction, the second width being less than the first width;

10 a third conductive line of the plurality of conductive lines having a third width, the third conductive line is spaced from the second conductive line in the second direction from the second conductive line, the third width being less than the second width, the second conductive line
15 between the first and third conductive lines;

a fourth conductive line of the plurality of conductive lines having a fourth width, the fourth conductive line is spaced from the third conductive line in the second direction from the third conductive line, the fourth width
20 being greater than the third width, the third line between the second and fourth conductive lines;

a fifth conductive line of the plurality of conductive lines having a fifth width, the fifth conductive line is spaced from the fourth conductive line in the second direction
25 from the fourth conductive line, the fifth width being greater than the fourth width, the fourth conductive line between the third and fifth conductive lines;

a sixth conductive line of the plurality of conductive lines
having a sixth width, the sixth conductive line is spaced
from the fifth conductive line in the second direction
from the fifth conductive line, the sixth width being less
5 than the fifth width, the fifth conductive line between the
fourth and sixth conductive lines;

a seventh conductive line of the plurality of conductive lines
having a seventh width, the seventh conductive line is
spaced from the sixth conductive line in the second
10 direction from the sixth conductive line, the seventh
width being less than the sixth width, the sixth conductive
line between the seventh and fifth conductive lines;

an eighth conductive line of the plurality of conductive lines
having an eighth width, the eighth conductive line is
15 spaced from the seventh conductive line in the second
direction from the seventh conductive line, the eighth
width being greater than the seventh width, the seventh
conductive line between the eighth and sixth conductive
lines;

20 a ninth conductive line of the plurality of conductive lines
having a ninth width, the ninth conductive line is spaced
from the eighth conductive line in the second direction
from the eighth conductive line, the ninth width being
greater than the eighth width, the eighth conductive line
25 between the seventh and ninth conductive lines.